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ABSTRACT

This report reviews the research and development (R&D) structures and practices for vocational education, training, and employment in the United States, Germany, France, Sweden, and England. The organization and management of each country's R&D system as well as R&D agendas and priorities are analyzed. General observations and implications for the setting of strategic directions for vocational education and training (VET) R&D in Australia are developed. Special emphasis is placed on the following: the role, governance, organization, management, and agenda of R&D; quality assurance; cost-effective use of resources; linkage of research, policy, and practice; and development of coherent policies for VET R&D. Appendixes include the following: a glossary of acronyms; the mission statement of the National Center for Research in Vocational Education, key issue areas of its research program, and Perkins Act requirements for its dissemination and training activities; information on the University of Pennsylvania's National Center on the Educational Quality of the Workplace, U.S. National Assessment of Vocational Education, and Centre d'Etudes et de Recherches sur les Qualifications; and the medium-term priorities of the German Federal Institute for Vocational Training and English Employment Department. (MN)

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A review of research and development structures and practices for vocational education, training and employment in five OECD countries

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A paper prepared by Peter Kearns and George Papadopoulos for the VEETAC Research and Development Working Party

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Foreword

The Vocational Educational Employment and Training Advisory Committee (VEETAC) Research and Development Working Party commissioned Peter Kearns and Associates to prepare a report on overseas research and development practices.

The VEETAC Working Party believed that the report deserved a wider readership and suggested that NCVER should publish the document as part of its important dissemination role.

Australia has never slavishly followed overseas trends, but has always taken careful account of best overseas practices. This report outlines how a small selection of overseas countries approach vocational education research and development. NCVER enjoys links with many overseas centres and exchanges information with them. Those wishing to find out more are invited to contact NCVER and its national clearinghouse.

Peter Henneken
VEETAC Working Party Chairperson

Preface

This paper has been prepared under the auspices of the Australian Vocational Education, Employment and Training Advisory Committee (VEETAC) to provide an overview of the arrangements for vocational education and training research and development (VET R&D) in five OECD countries. These countries are the United States, Germany, France, Sweden and England.

The paper is intended as an input to the work of a VEETAC working party which has been established to develop recommendations for a national R&D strategy for VET in Australia. We have consequently sought to identify broad approaches and strategies adopted in the countries considered as well as commenting on particular aspects of the organisation and management of the R&D system.

Section 5 of the paper sets out a number of general observations and implications and provides an overview of the main issues and developments considered in the paper.

Acronyms are used for the various research centres discussed in this report. A glossary of acronyms is given in Appendix A.

In preparing the paper, one of the co-authors visited VET R&D centres in San Francisco, Berlin and Paris and was greatly assisted by discussions with government officials in Washington, London, Sheffield and Stockholm, and with the OECD secretariat. We are most grateful for the ready assistance we received, although the conclusions and observations of the paper are those of the authors alone.

Vocational education and training is currently in a period of fundamental re-appraisal and reform in most of the countries discussed in this paper. Some of the reasons are set out in Section 1 of this paper. A quality R&D system responsive to reform objectives and issues can make a significant contribution to the achievement of the reform objectives. It is therefore timely to consider arrangements for the organisation and management of VET R&D systems in a range of OECD countries in the context of setting strategic directions for VET R&D in Australia.

1 Background and context

VET, as in education more generally, the demarcation between what is research and what is policy is never very clear. The choice of research fields in education and often of the people who will carry out such research, is in itself an act of policy. These inter-relationships must be recognised from the start in any discussion of strategies for R&D in VET.

Two additional contextual considerations should be borne in mind. Firstly, the share of resources within public educational budgets that has been allocated to R&D, though it has varied from time to time, has remained relatively insignificant, compared to other sectors of public policy of similar magnitude. The share allocated directly to VET R&D has been even less significant. Secondly, with growing constraints on public spending and the increasing politicisation of education in many countries, an instrumentalist approach to publicly-funded education R&D has come to dominate the scene, reflecting governments' interest in directing research to serve the specific policy objectives which they set for the development of their education and training system. There has been a corresponding diminution in the resources available for free, uncommitted research which was the dominant practice in the past.

This being said, it must also be recognised that the recent resurgence of political interest in education, and VET in particular, primarily economic-driven, has provided a propitious climate for increased support of education and training in industrialised societies and correspondingly for educational R&D. Yet the paradox remains that VET, in spite of the political and economic importance which governments attach to it—particularly since the onset of severe unemployment from the mid-seventies onwards—continues to be the poor partner in both these aspects of the educational enterprise.

There are many reasons for this. In the cultural tradition of western societies, VET has always been held in lower esteem than academically oriented education. As such, it has never succeeded in realising an adequate level of academic respectability such as to make it attractive to the interests and professional aspirations of the research community. It has by and large been the preserve of the employment sector. Such innovations as were undertaken emanated from the requirements of the working place and were pursued primarily through developmental rather than through research activities. At best, any research built into such activities was in the form of evaluative research to judge the impact of developmental projects or initiatives. This on the whole continues to be the case today. Moreover, employment interests were often seen to be in conflict with other objectives, particularly educational, such as personal development and social objectives.

These differentiated and disparate interests are best illustrated by the cleavage between VET directed to young people and that directed at adults. In the case of the former, it is now generally recognised that the initiative for reforms is essentially school-based, particularly as a consequence of the generalisation of secondary schooling. Changes in VET are increasingly seen as part and parcel of overall schooling changes, with the main emphasis on breaking down the traditional dichotomy between what is general and what is vocational and technical education.

In the case of adults, the primary responsibility is industry-based, with governments playing a limited role in ensuring an adequate volume and equal distribution of training opportunities and in providing for the unemployed. While it is true that enterprises are making increasing efforts to co-operate with educational institutions in their training activities, the gap between school-based and enterprise-based education and training remains largely unbridged. In spite of the lip-service that many countries pay to the concept of life-long learning, in practice its objectives remain unfulfilled.

A final consideration has to do with the difficulties arising from the particularities of the educational and industrial structures which prevail in different countries and which largely determine the articulation of VET into these systems. Different approaches will apply whether a country has an all-through comprehensive school system, as in Sweden, for example, or a selective or 'dual' system of the kind applying in Germany. The same considerations apply to the structure of post-secondary school systems, particularly as between those which provide extensive opportunities for short-cycle, vocationally oriented education and those where the traditional selective university model dominates. Similar issues are raised by differences in industrial practices and structures; German firms are so organised as to be committed to co-operating with the educational system on apprenticeships. Japanese firms assume full responsibility for the vocational preparation of their employees, expecting from the school system well-educated generalists.

Towards coherent policies for VET R&D

Against the above background, it is not surprising that until recently in practically no country has there been evidence of the formulation of specific policies for VET R&D. There are signs that the situation is now changing, with ad hoc approaches giving way to more institutionalised forms of activity, reflecting more systematic, publicly sponsored efforts towards the development of coherent policies in this area. The ways in which a number of countries are groping in this direction and the characteristics of the systems which are emerging will be outlined below. Before doing this, however, it will be useful to outline the main areas which are the concern of such policies. Two levels of concern can be distinguished in this respect: the strategic and operational levels.

At the strategic level, the central concern is with the overall place of VET in the broader educational, economic and social systems.

Within the educational perspective, a main objective is the search for ways and means by which new learning strategies can be developed and VET can be renovated and its status raised. This is considered essential both for enhancing the efficiency of VET itself and for the stimulus it can provide to school improvement more generally. Present United States policies provide an eloquent example of this concern.

Economic considerations occupy a dominant place in attempts at reforming VET, in line with the essentially economic objectives which VET serves. This explains the predominant role which research into the economics of vocational education and training occupied in the past, in terms of both rates of return and contribution to productivity growth. Such research has not proved to be operationally useful and there is now a shift away from it, with attention being increasingly focussed on the extent to which occupations can be used as a basis for organising VET provisions.

Forecasting the precise nature of the evolution of occupational structures remains, of course, an uncertain and perplexing enterprise, but nonetheless an intriguing field for research. In this, particular attention is being paid to the preponderant role which the service sector and service activities are coming to occupy in the economy, implying as it does that employees at all levels deal increasingly with people and information rather than with things. What this means for VET, and in particular the extent to which existing apprenticeship systems can respond to this development, has yet to be fully explored. Special importance in this respect attaches to the impact which the rapid expansion of the service sector has on the career opportunities towards which, by their education and training, young girls and women have been traditionally attracted.

Social concerns, side by side with economic ones, feature prominently in the search for more effective VET provision. The accent is on how VET could play a stronger role in drawing more people into the mainstream of social and economic life and avoid the marginalisation of disadvantaged groups. The United States provides abundant examples of developmental projects in this area, both at the micro-level, designed to address the problem of specific groups and regions and of a more macro nature, reflecting policy stances towards social equity in a broader sense. Much evaluative research in the results of these projects is being developed, including analysis of changes in the social composition of participants in various programmes. A tentative conclusion, which needs to be further researched, points to the need for a stronger dose of mainstreaming, at least at the level of basic schooling, as a prerequisite to the attenuation of social disparities.

At an operational level, a number of key issues have arisen from current developments in VET in the context outlined above. These key issues are, in general, common across the five systems discussed in this paper and include:

- the learning process and learning strategies;
- the competencies and skills required in a modern technology-based economy;
- how these skills are acquired;
- VET efficiency and effectiveness.

We comment on these issues in Part IV of this paper in the context of R&D agendas and priorities in the five countries.

A further contextual consideration of growing importance involves the relationship of VET R&D to educational R&D and social science research generally. For the reasons we discuss in this paper, these linkages are assuming increased significance, in line with developments in VET itself, and it is not sensible to make a sharp separation between VET R&D and the broader fields of educational and social science research.

VET R&D draws upon the findings of educational and social science research in such areas as cognitive science and curriculum research. For this reason multi-disciplinary approaches are often required in areas such as issues involving relationships between the education system, VET and the labour market. A central issue in the organisation and management of VET R&D is how effective linkages with educational and social science research can best be fostered.

To our knowledge VET R&D has not previously been examined across the range of OECD countries we consider in this paper. However, there have been a number of studies of educational R&D in OECD countries and in Europe and several important reviews of educational R&D in the United States.

The issues examined in two of these studies of educational R&D in the United States—the OECD 1969 review of United States educational R&D and a 1992 review of the work of the United States Office of Educational Research and Improvement (OECD 1992) are relevant to consideration of the organisation and management of VET R&D and we have drawn upon both reports.

2 Organisation of the R&D system

Organised government funding of VET R&D is a recent development. The first government R&D centre in the field of vocational education and training in Europe, the German Federal Institute for Vocational Training (BIBB) was established in 1970. This was followed by the establishment of the Italian Istituto per lo Sviluppo della Formazione Professionale dei Lavoratori (ISFOL) in 1973 and the French Centre d'Études et de Récherchés sur les Qualifications (CEREQ) in 1976.

In the case of the United States, the current arrangements for a government funded National Centre for Research in Vocational Education (NCRVE) were put in place by the Carl E Perkins Vocational Education Act of 1984, although federal funding of research in this field had existed for some years before 1984.

The establishment of a number of government research centres in this field during the nineteen seventies was largely a response to the problem of unemployment that existed at the time, in particular the problem of high youth unemployment in a period of demographic pressure from large youth cohorts.

Over the past twenty years the work of these centres has developed from its initial focus on youth unemployment in the light of changing economic and social conditions. As a consequence a range of arrangements for the organisation and management of VET R&D has evolved in OECD countries.

In the section that follows we examine these arrangements in respect of such aspects as the organisation of the R&D effort, the determination of priorities, quality assurance methods and the dissemination of the outcomes of research.

Organisation of research and development

Three broad approaches to the organisation of research and development for vocational education and training may be identified in the countries considered in this paper. These are set out below.

Exhibit A: Organisation of VET Research and Development

	Approach	Countries
A	the establishment of a government research agency	Germany, France
B	the establishment of a national centre in the university system	United States
C	a decentralised, pluralist system with no central focal point	Sweden, England

We comment below on some of the main features of these approaches and then consider the management of R&D for VET within these structures.

Approach A
Government research agencies

Germany and France illustrate the approach of organising VET R&D through establishing a government research agency. However, the two systems differ substantially in the light of the different approaches taken to vocational education and training in these countries and BIBB has a considerably broader role than CEREQ.

Whereas the work of CEREQ is focussed on research, statistical collection and analysis and the provision of advice to government agencies, employers and unions, the BIBB role extends beyond these functions into development aspects directed at the delivery of training in various contexts.

Germany

BIBB was established in 1970 to undertake research and development in vocational training under the terms of the Vocational Training Promotion Act.

BIBB operates in the context of the German dual system with its complementary components of company training and formal institutional training. The focus of the Institute's work is on in-company training although it also provides expert advice to the Federal Government, employers and unions on training matters.

Training in the German dual system is controlled through government regulations which set standards for training. BIBB has an important role in providing a research input into training regulations and in seeing that training provision keeps abreast of technological, economic and social change.

The German training system operates on the basis of well understood arrangements which involve employers, unions and government in the administration and development of the system. The system is strongly tripartite at all levels so that the work of BIBB is attuned to this environment.

BIBB while established under federal law and funded by the federal government, operates under a governing board in which employers, unions, state governments and the federal government have equal representation.

This arrangement has considerable advantages in terms of commitment by each of these parties to the work of the Institute. The four sectors linked to the governing board further provide a natural channel for dissemination of the outcomes of the Institute's work.

The BIBB governance arrangement means that it is difficult for any single party to dominate the work of the Institute so that this arrangement fosters a consensus approach.

France

The Centre d'Études et du Récherchés sur les Qualifications (CEREQ) was established in 1976 in order to provide a centre for research on the relationship between education, training, work and employment and to assess the implications of developments in these fields for education and training policies.

France has a centralised system of education with streaming in both secondary schooling and in further and higher education. In such a system CEREQ provides a research base for work on the education, training employment interfaces that is able to influence policies for education and labour market training.

CEREQ became an autonomous agency in 1985 with relationships to both the Ministries of Education and Social Affairs. This reflects the respective responsibilities of these Ministries for education and training. CEREQ serves as an expert adviser to both Ministries and is frequently involved in working parties and committees concerned with education/training/employment issues.

Employers and unions, as well as government agencies, are linked to the work of CEREQ through participation in two councils which guide the work of CEREQ.

Like the American NCRVE, CEREQ has developed a network of linked research centres in universities across France which are associated with the work of CEREQ. There are currently 15 Associated Centres in universities in cities such as Rouen, Strasbourg, Toulouse, Lille, Dijon and Grenoble which receive funding from CEREQ. This means that CEREQ is able to draw upon the expertise and resources of university research in these centres and to benefit from a network linking into all the main regions of France to supplement the work of its 60 research staff.

CEREQ is to move from Paris to Marseilles in September 1992 as part of the French Government's decentralisation policy. This will involve a considerable turnover of staff and is likely to lead to new perspectives in the work of CEREQ.

Further information on CEREQ is given in Appendix H.

Approach B
Establishment of a national centre in the university system

The United States illustrates the approach of establishing a national R&D centre in the university system in order to provide a focal point for R&D and to serve as a catalyst to foster research in this field in the university system.

While the United States Government had funded research in the area of vocational education and training prior to 1984, the Carl E Perkins Vocational Education Act of 1984 became the foundation for the present arrangements.

The Perkins Vocational Education Act empowers federal grants to the states for vocational education. As part of its support of vocational education, the Act also empowers the establishment and funding of a national centre for research and development in vocational education.

Funding for the centre is authorised for a period of five years and the 1990 amendments to the Perkins Act extended the requirements and objectives of the Act in a number of other directions without changing the basic approach to the role of a national R&D centre.

A distinctive feature of the American approach is that the location of the centre is awarded for a period of five years following a national competition. The centre was initially located at Ohio State University but was relocated at the University of California at Berkeley in 1988, in the Graduate School of Education, following a further competition.

The Perkins Act empowers the Secretary for Education to award grants for the establishment of 1 or 2 national centres in the areas of:

(a) applied research and development; and
(b) dissemination and training.

The Berkeley centre combines both areas. This broad mandate of the centre across the areas of applied research, development, dissemination and training distinguishes the centre from the other 25 national research and development centres funded by the Office of Educational Research and Improvement (OERI) within the United States Department of Education. These centres are restricted to a research and development role with a further network of Regional Education Laboratories undertaking a mix of development, dissemination and training activities. Some of these laboratories undertake activities in the field of VET.

It is of interest to note that the network of OERI federally funded research and development centres also includes a centre with a mandate in the area of vocational education and training. This is the National Centre on the Educational Quality of the Workforce located at the University of Pennsylvania. Appendix E sets out a summary and abstract on the work of this centre.

The American arrangements are complex and as well as the Berkeley and Pennsylvania centres, the Educational Resources Information Centre (ERIC) also has a clearing house role in the areas of adult, career and vocational education with one of its clearing houses covering these fields.

The National Centre for Research in Vocational Education (NCRVE) at the University of California, Berkely, operates through a consortium of sub-contractors. This provides a network extending through the American higher education system.

Three of the sub-contractors are the delivery points for service functions. The sub-contractors linked to the NCRVE are set out below:

Exhibit B: ***National Centre for Research in Vocational Education Sub-Contractors***

NCRVE Sub-Contractors	Service Function
• Teachers College, Columbia University	—
• RAND Corporation	—
• University of Minnesota	Leadership development
• University of Illinois	Technical assistance for special populations
• Virginia Polytechnic Institute and State University	In-service education

This mix of institutions linked to the NCRVE is of interest in that three of the institutions have teaching programs in the area of vocational education (Illinois, Minnesota, Virginia) and three do not (Columbia, RAND, Berkeley). The total network combines considerable research strength with teaching experience in VET.

This consortium approach is also common with the OERI national research and development centres. The network concept has the dual merits of drawing upon a wider range of expertise and resources and fostering awareness of this research field through a number of universities although it is also sometimes argued that this approach dilutes the concept of a national centre.

Information on the Mission Statement and current research programs of NCRVE is given in Appendices B and C.

Approach C
Decentralised pluralist systems

A third approach to the organisation of research and development for vocational education and training may be observed in those countries with a pluralist, decentralised system without a central research agency. Sweden and England illustrate this approach.

Both England and Sweden have emphasised the autonomy of university research and have adopted a general 'hands off' approach in respect of university research. England supports research in the field of education and training through the Economic and Social Research Council and Sweden has established a similar model with recent developments in the organisation and management of research including strengthening the role of research councils.

This general approach is consistent with substantial funding of mission-oriented research through government agencies and both England and Sweden have supported research in this way — England through the former Manpower Services Commission and its successor bodies in particular, and Sweden through the former National Board of Education.

The absence of a national focal point in these systems in a period of major reform in education and training raises a number of significant questions with respect to the organisation, co-ordination and management of research in such a system. A key question is whether a research 'market' approach supplemented by funding of mission-oriented applied research through government agencies is sufficiently responsive to changing national R&D priorities while at the same time fostering the development of longer-term research objectives.

Sweden

Sweden has moved to review its general arrangements for research in recent years, in particular since the change of government after a long period of Social Democratic government.

The outcomes to date from this general re-appraisal have included:

- a confirmation that the higher education system is the research institute of the community as a whole with the research councils as the national faculties;
- retaining sectorally motivated research as the instrument of linking research to policy development;
- a greater emphasis on the role of the research councils in deciding research priorities;
- a recognition that research workers themselves should be part of the decision-making process in research funding;
- a re-affirmation that national government research agencies should, in general not be established (Ohrstrom 1991).

These general principles apply in the field of vocational education and training. There is no national research agency along the lines

of BIBB, CEREQ or the NCRVE and pluralism is regarded as a desirable condition with the relevant research council functioning as a funding and priority setting body.

This general approach is supplemented by direct government sectoral funding through bodies such as the former National Board for Education.

Vocational education in Sweden is provided through the upper secondary schools where a wide range of vocational lines exist. This means that it is difficult to separate research for VET in the Swedish context from general educational research.

As part of a current thrust to increased decentralisation in education, the National Board of Education has been abolished and a successor body the National Agency for Education established. This agency has reduced staffing and more limited powers than the National Board with local authorities now expected to have a greater role in schooling.

As an aspect of the current changes a review of educational R&D in Sweden is being undertaken. This review is appraising the history and contribution of educational research in Sweden and assessing possible future approaches. A mixed overseas and Swedish panel of experts is participating in the review so as to provide a variety of perspectives. The overseas experts include Norwegian and English academics with Swedish academics providing a Swedish input.

This review is not yet complete so that future arrangements for research and development in VET remains uncertain.

On the training side, the Labour Market Agency (AMS) and Training Agency (AMU) both use research but do not appear to have a research program of the magnitude of the English Employment Department.

England

England is similar to Sweden in having a pluralist system of research and development without a national research centre in the area of VET. The English system is loosely co-ordinated with considerable weight put on university autonomy linked to a system of research funding through research councils. Nevertheless, an important influence in the English scene has been the active research program of the former Manpower Services Commission and its successor body the Employment Department. In addition to the Employment Department and the new Department for Education, to a lesser extent, other agencies such as the National Council for Vocational Qualifications and the Further Education Unit have supported R&D in the area of VET.

The traditional English decentralised system of education has been challenged over the past two decades by a growing political interest in education and training, largely for economic reasons relating to England's competitive position in world markets. This interest is reflected in such outcomes as the Education Reform Act of 1988, the reform of vocational qualifications, the decision to replace local education authority funding of further education by national funding and the reform of training.

These developments are reflected in the research area. While the traditional autonomy of universities in research remains, with research funding through Research Councils, there has been a growing emphasis on accountability, effectiveness and efficiency. This has gone along with an increased emphasis on applied and evaluative research rather than fundamental research (US Department for Education 1992).

The Economic and Social Research Council funds educational research and has recently set up an Educational Research Working Group to review research in the field of education. While VET proposals are eligible for funding by the Council few succeed in obtaining funding and the school sector dominates educational research funding by the Council.

In this situation the main funding of VET research and development comes through government agencies — in particular the Employment Department, the National Council for Vocational Qualifications (NCVQ), the Further Education Unit and the Department for Education.

The Employment Department has continued the strong interest of the former Manpower Services Commission in applied and evaluative research and has an extensive research program. NCVQ has done a good deal to stimulate research in the field of vocational qualifications and related areas.

The pluralist English approach raises a number of issues concerning how mission-oriented applied research funded by government agencies can be linked to the disciplinary research of universities. There is further the question as to whether there is sufficient focus from a policy perspective in the diffuse English arrangements.

The Employment Department and NCVQ have both recognised the need to support the longer-term development of research capability in the fields of interest to them in the university system. Several research centres in universities such as Sussex, Sheffield and Nottingham have been supported. There is further comment below on measures supported in the area of VET in the university system.

Some consequences of these approaches

While the approaches outlined above differ significantly in key features, there are also common interests and objectives which are reflected in the arrangements adopted for the management of the R&D system.

The outcomes of these different approaches to the organisation and management of research and development may be assessed in terms of such considerations as:

- the impact of research and development on policy and practice;
- the quality of research outcomes;
- the extent to which the approach adopted acts as a catalyst to university research in these fields;
- the responsiveness of the system to emerging priority issues identified by governments and the other key players;
- cost effective use of resources.

In practice most of these objectives appear to be pursued by the systems discussed although the balance varies between countries and between the approaches adopted by education and labour market authorities.

Government research agencies such as BIBB and CEREQ are, in particular, responsive to the research priorities of governments. However, each has adopted a medium-term perspective in its work so that particular short-term issues are related to a broader framework with concern for the continuity of the research effort. Both bodies have links to employers and unions as well as governments which provide useful channels for the dissemination of research findings. CEREQ has further developed links to university research through its network of Associated Centres in universities.

The American NCRVE model illustrates a number of these features, but in a university environment further removed from direct government influence. Academic norms and values dominate in the work of NCRVE although its agenda is linked to national priorities through the requirements of the Perkins Act. The networking approach of NCRVE has value in linking the work of the Centre to university research, both basic and applied, across the United States.

The pluralist English and Swedish systems appear to lack the focus that a national centre such as BIBB, CEREQ or NCRVE provides. This becomes important in a period of major educational and training reform where an intermediary body located between government, employers and unions and the higher education research system can play a significant role in linking research, policy and practice if managed in ways that maximise such linkages, and in enhancing the identify and status of VET. We comment on issues relating to the management of the research system in the section that follows.

3 Management of research and development systems

Current developments in the countries reviewed in this paper demonstrate an increased concern with the efficient management of the research and development system. While this objective is common in a period of stabilised or decreased funds for R&D and a number of common themes may be observed, there is also considerable diversity in the approaches adopted to the management of the research and development system.

Management arrangements involve a balancing of a number of concerns, in particular efficiency in the use of R&D resources, accountability pressures, participation in the research and development process by interested players, how best to ensure quality and how to achieve improved linkages between research, policy and practice. We comment on these themes in the sections that follow dealing with various aspects of the management of the system.

A central theme is how to make more efficient and effective use of limited research resources in a period of generally reduced research budgets. This pressure has prompted a search for improved methods of management in such aspects as setting the research agenda, making effective use of research results and ensuring quality.

A notable response to this requirement has been the growth of co-operative arrangements between research institutions and agencies. In the United States this has involved the development of consortia arrangements between universities and with research agencies such as RAND. In Europe there has been a significant development of co-operation between research agencies, both within multilateral frameworks such as the EEC, and also through strengthened bilateral relationships.

Setting the agenda

Setting the research agenda and determining priorities has assumed increased significance in a period of major educational and training reform combined with restraint in government expenditures and diminished research budgets.

Procedures for determining the research agenda generally involve a balancing of government priorities with a recognition of the need to provide for researcher-initiated contributions. The trade-offs involved in the procedures adopted can be more clearly seen in the case of countries with national research centres.

In the case of the United States, arrangements for setting the research agenda involve a balance of national priorities which are built into the governing federal legislation and the procedures

adopted by the NCRVE which respond to federal priorities while at the same time providing for researcher inputs into the agenda.

The Carl E Perkins Vocational Education Act authorises grants to the states for vocational education and empowers the establishment and funding of the NCRVE. This is for a period of 5 years.

The Act identifies national priorities through its special funding programs and requirements. The 1990 amendments to the Perkins Act involve four principal thrusts:

(i) support for special populations, especially economically disadvantaged groups;
(ii) the integration of academic and vocational provision;
(iii) Tech-Prep education; and
(iv) the development of performance standards and measures in the States.

In addition, Title IV Part A, which authorises the establishment of the NCRVE, sets out a number of fields that the applied research and development activities to be funded shall include. We comment on these fields below in Section 4.

The NCRVE has regard to the requirements of the Perkins Act in setting its research agenda but has substantial autonomy in devising a research and development program that responds to the requirements of the Perkins Act. While NCRVE submits its annual program to the Department of Education's Office of Vocational and Adult Education, it is unusual for the Department to intervene in the details of the NCRVE program. However, the Perkins Act also carries a requirement that the secretary of education shall review the research priorities of the National Centre after the third year of funding so that there is pressure for the National Centre to respond to the priorities of the Perkins Act.

For its part, NCRVE has devised careful procedures which commence in the January preceding the program year under consideration. These steps involve:

(i) a 3-day planning meeting in January which involves the site directors from each of the sub-contractors in the NCRVE network which sets broad priorities for projects to be funded in the following calendar year;
  - this meeting also addresses quality issues and may lead to project proposals being invited;
(ii) consultations then follow in the period January/April with researchers and practitioners on the preliminary list drawn up at the January planning meeting with short proposals due in by May;
(iii) a follow-up meeting is held in the light of the outcomes of consultations, with site directors again involved, which leads to requests for complete project proposals being developed

as part of a general 'shopping list' for the following year by mid-June;

(iv) site-directors liaise within their institutions in the stage of project proposals being developed;

(v) proposals are evaluated by a peer review process which involves a review panel in the period from June
- the review panel involves a group of about 8 which includes both researchers and practitioners;

(vi) negotiations on budgets for the selected projects follow in the period from October which leads to a continuation application which goes to the Department of Education for approval.

The significant aspects of these procedures are:
- the involvement of the sub-contracting institutions at all stages of planning;
- the involvement of both researchers and practitioners at various stages; and
- the part played by peer review procedures.

There is an increasing trend to multi-institutional projects within the NCRVE network.

While the German BIBB centre does not operate on a network basis in this way, it also seeks to balance government priorities with researcher-initiated proposals. The usual balance is for about one-quarter of the research agenda to be on the basis of requests from the Federal Government while about one half involves projects generated by staff.

The BIBB research agenda is approved by its board which includes equal employer, union and federal and state government representation. Hence it is open to any of these parties to influence the agenda of BIBB while the balance of the board membership ensures that government interests do not dominate the research agenda and that practical issues of interest to employers and unions are included in the program.

The importance placed on researcher-initiated projects in both the NCRVE and BIBB procedures involves a tacit recognition that short-term government priorities should not dominate the research agenda.

The dominance of direct government funding in the field of VET research, and the relative weakness of university research in most OECD countries in this field, involves the danger that short-term applied mission-oriented research will dominate the agenda to the detriment of basic research.

The NCRVE and BIBB procedures and those of CEREQ with its network of associated centres, seek to achieve some balance through the weight placed on researcher-initiated projects. These procedures enable individual researchers to foster links with basic

research and to bring a longer-term perspective into the agenda. In this way there is an attempt to link government funded applied research with 'micro-islands of more fundamental research'. (Hamilton p. 15).

Cost effective use of resources

In a context where research budgets generally have decreased there are manifest pressures in the countries considered in this paper to manage the research and development system so as to ensure cost-effective use of resources.

This has led to a number of responses:

- accountability pressures to identify the outcomes of research in monitoring and reporting requirements;
- increased co-operation between R&D institutions so as to maximise the use of available resources and expertise through consortium and networking arrangements.

The NCRVE consortium network of sub-contractors illustrates one response to these pressures. Within Europe national research centres collaborate through the programs of multilateral agencies such as the EEC Centre for the Development of Vocational Training (CEDEFOP). CEDEFOP has convened on an annual Research Directors Forum since 1985 and has been the focus for various multilateral collaborative projects within the EEC context.

CEREQ has recently reported on the expansion of its bilateral relations and its involvement in various European networks (CEREQ 1992). These include bilateral collaboration with BIBB and involvement in the following European networks:

- a network on social and labour market entry of young people involving research groups from 10 EEC countries;
- a network linking CEREQ, BIBB, ISFOL and CIBD which will undertake work for international organisations, governments and regional bodies;
- participation in the OECD VOTEC Program (Vocational and Technical Education and Training).

These cross-country network developments represent a further stage in the internationalisation of research and raise issues for Australia on account of its geographic isolation from these developments.

Growing accountability requirements are reflected in the recommendations of the recent American National Research Council report *Research and Education Reform*. The recommendations of this report include a proposal that a stronger OERI board should be established to oversee the OERI research program and that the board should publish a biennial report which describes the accomplishments of the research program, indicates the activities and funding levels, identifies current needs and makes recommendations for future directions (National Research Council 1992).

Fostering quality

Current developments in both vocational education and training and in research have enhanced the requirement to foster quality in R&D.

Various indications may be observed in the countries under review that VET R&D has traditionally lacked the prestige and status of mainstream educational R&D and that this has gone along with a common perception that R&D in this field is of a lesser quality. The traditional marginalisation of VET has been reflected in this perception of a lesser quality in R&D in this field.

The validity of this perception is difficult to assess. If indicators such as the number of VET proposals which receive funding in open competition from funding bodies such as the English Economic and School Research Counsel are used, few VET proposals secure funding and the great bulk of funds for education research goes to proposals relating to the school sector.

Further, reports on education R&D from Germany, Sweden and England all comment on the relative lack of development of R&D in the field of VET in universities in these countries.

On the other hand, some of the most prestigious American universities have become involved in VET R&D. Universities such as Cornell, University of California Berkeley, Teachers College Columbia and the University of Pennsylvania as well as research agencies such as RAND, are currently active in VET R&D. A question of interest is therefore the extent to which the American approach to the organisation, funding and management of VET R&D has led to the entry of some of America's most prestigious universities into R&D in this field. In addition to government funding policies, funding by private foundations has been an influence in the American situation.

The research centres discussed in this paper have each developed careful internal report review procedures as a quality assurance mechanism. NCRVE has peer review procedures for all reports and nothing is published without peer review. The English Further Education Unit operates in a similar way and all draft reports go to groups of readers for peer assessment.

In addition to the quality of individual reports, the quality of VET R&D depends critically on the calibre of the researchers attracted into this field and general research training.

It is not surprising that we found little evidence of explicit government policies to develop the capability of the VET R&D system in such aspects as research training for the reasons outlined in Section 1 of this paper.

However, the impact of the existence and work of centres such as NCRVE, CEREQ and BIBB is likely to have some impact in the longer term on the quality of the system. In addition, some

government agencies have adopted policies to foster the development of programs in the university system that will contribute to fostering research capability in the area of VET.

The English National Council for Vocational Qualifications (NCVQ) is one such body. NCVQ has supported the development of post-graduate programs, at both MSc and PhD levels, at the University of Sussex in the area of VET. These programs adopt the National Vocational Qualifications model of the council and the methodology developed by the council.

Moreover, the council has a Fellowship Program whereby two NCVQ Fellows are enabled to obtain experience within the council. There is a program of part-time secondments as well so that in these ways the council is seeking to develop closer relations with the university sector and to contribute to the development of a high quality VET R&D capability in the university system.

The need to enhance the recognition and status of VET R&D suggests that ensuring quality will be an on-going concern.

Linking research, policy and practice

There has been a growing interest in the countries discussed in this paper in finding more effective ways of linking research, policy and practice. This interest has been stimulated by the influences discussed above including pressures for increased accountability and cost-efficiency in the use of limited resources and various contextual influences such as the current reform agenda in VET and in education more generally.

Moreover, there is a fairly general view that R&D has had a less-than-significant impact on policy and practice up to now.

One manifestation of this trend has been a resurgence of interest in interactive models that link researchers, policy makers and practitioners more closely in the various phases of the research/development/dissemination process.

We have commented above on the involvement of practitioners in the agenda setting phase, as for example in the procedures adopted by the NCRVE in developing its research agenda.

Similarly, the procedures for the Carl E Perkins Vocational Education Act lead to a dialogue between policy makers and the research community within the ambit of the Congressional committee system in re-authorisation procedures. The requirements of the Act produce an on-going dialogue between the Department of Education and the NCRVE on the annual program of the Centre with a review of priorities in the third year.

In the case of dissemination of research findings, more integrated arrangements are developing in a number of these countries in which dissemination is viewed as an essential component in an

on-going process rather than as a series of isolated events. This move away from a one-shot single publication approach to a process model more attuned to the complex ways in which research influences policy and practice is a significant development.

The philosophy and procedures adopted by the NCRVE illustrate this approach. NCRVE has adopted the following philosophy in respect of service functions generally:

'To the extent feasible service functions are integrated with research so that dissemination becomes a natural bi-product of research.'

Exhibit C sets out the policy of NCRVE in respect of its service functions.

The National Research Council Report Research and Education Reform adopted a similar integrated approach in the area of schooling and recommended changes in OERI in order to foster improved integration of research, development, demonstration, dissemination and school assistance activities.

In order to operationalise this concept, NCRVE operates on the basis that outcomes are required to be specified for all research projects in the project design, including proposed dissemination of results, so that dissemination strategies become an integral component of project design.

Current approaches to dissemination also involve:

- a growing diversity of methods including the use of electronic networks;
- increased interest in the accumulation and documentation of research findings over a period of time;
- the provision of summaries of research findings in reader-friendly form for policy makers and practitioners;
- fostering networks of practitioners linked to the research centre by such means as electronic mail;
- the use of field agents as dissemination agents as a mechanism for feedback to researchers.

The dissemination policies and products of the NCRVE illustrates most of these trends. These operate under a director of dissemination and include the following:

- Resources in Vocational Education (RIVE)

  This is a specialised database covering on-going and recently completed projects in the fields of vocational education. RIVE contains over 14 000 records and includes descriptive abstracts of projects.

Exhibit C: The service functions of the national centre for research in vocational education

In addition to research and development, NCRVE must perform various service functions for vocational educators and policymakers. The Carl E Perkins Vocational Education Act specifies the activities which NCRVE must undertake:

- Provide leadership development.
- Provide inservice education for state and local leaders in vocational education.
- Disseminate the results of the research and development projects funded by the NCRVE.
- Provide information to facilitate national planning and policy.
- Provide technical assistance to programs serving special populations.
- Act as a clearinghouse on research, curriculum development and personnel development.
- Work with various public agencies in developing methods of planning and evaluating programs.
- Report to Congress, the Secretary of Education and the Secretary of Labor on joint planning and coordination under the Perkins Act and the Job Training Partnership Act.

We view these various activities as different forms of dissemination, broadly interpreted—that is, different ways of making the research and development of NCRVE useful to teachers, administrators, policymakers and other researchers.

Several principles will guide NCRVE's service efforts. First, to the extent possible, service functions will be integrated with research programs and performed as part of the six issue areas described in part one.

Second, the various services in general, and dissemination in particular, will be designed to integrate researchers and practitioners, rather than to keep them separate in different worlds.

Third, as a general proposition, NCRVE will attempt to build up the institutional infrastructure of vocational education through leadership development and inservice education.

Finally, the policy forums that will operate as part of the requirement to provide information for national planning will place high-level policymakers and practitioners in contact with each other, again facilitating the institutional linkages and informational flows necessary for the development of vocational education.

- ADVOCNET

  This is an electronic communications network that links federal, state and local personnel involved in vocational education. The network includes ADVOCNEWS which is an electronic bulletin board for the use of ADVOCNET members.

- Centre work

  This is the centre's newsletter which provides information on the activities of NCRVE.

- Change agent

  This is a periodical which summarises the results of centre projects.

- Training networks

  Several sub-contractors undertake the training activities of the centre. New approaches include the development of training networks linked by electronic communications networks.

The summer institutions to be conducted by NCRVE in the following fields illustrate the concept of training networks as a dissemination method.

- Establishing tech prep programs in urban schools
- Establishing the integration of academic and vocational education in urban schools.

Each institute is conducted for a week during the summer vacation. For the Tech-Prep Summer Institute, ten urban school districts will be invited to send teams of 9-12 representatives from collaborating secondary and post-secondary institutions. Participants in the institute are required to serve as a resource contact person for others in their areas and to participate in an on-going network involving participants in the Institute.

Systems sending participants to the institute are required to guarantee release times for participants for follow-up activities. In this way the institute participants serve as an on-going network of change agents linked to NCRVE and each other through use of an electronic bulletin board. Research findings relevant to Tech-Prep programs are able to be disseminated through such on-going networks.

The Institute on the Integration of Academic and Vocational Education in Urban schools is conducted on a similar basis to the Tech-Prep Institute.

School teams select an integration model, design and implement a plan and monitor results. Institute participants continue as a network after the institute using an electronic bulletin board for communication among institute members.

In addition to the dissemination strategy of the NCRVE, the Perkins Act mandates a number of other requirements in the area of dissemination. The secretary for education is required by the Act to establish a system for disseminating information resulting from R&D activities supported under the Act. In doing this the secretary is required by the Act to use existing dissemination systems including:

- the National Diffusion Network
- the National Centre for Research in Vocational Education
- the National Network for Curriculum Co-ordination in Vocational and Technical Education

These requirements mean that the dissemination activities of NCRVE have to be related to a broader national dissemination strategy.

The National Diffusion Network (NDN) was established in the early 1970s along with the Joint Dissemination Review Panel (JDRP) to provide a mechanism to judge the effectiveness of innovative programs and to help disseminate those that are found effective. In 1987 JDRP was re-structured and renamed the Program Effectiveness Panel (PEP). PEP functions to validate effective innovative programs which are then disseminated through the National Diffusion Network. Appendix D provides further information in the NDN/PEP system.

The National Network for Curriculum Co-ordination in Vocational and Technical Education (NNCCVTE) receives funding from the Department of Education under the terms of the Perkins Act. Six curriculum co-ordination centres, a directors' council and fifty-nine state liaison representatives comprise the Network which provides curriculum services for state and local systems. The centres are funded on a rotational basis with two new centres awarded contracts each year.

The American arrangements are complex and the Department of Education in its co-ordinating role is required to ensure that there is effective co-ordination between the work of the NCRVE, NDN and NNCVTE.

Developing on-going networks for dissemination/feedback is similar in some respects to the role of field staff as intermediaries between researchers and practitioners. The English Further Education Unit uses a network of regional officers across England to assist in disseminating research results, maintaining on-going liaison with institutions and serving as a conduit for feedback from practitioners to researchers.

The FEU has a network of 10 regional officers across England serving a linking function between the FEU and further education institutions. Activities such as conducting seminars serve to disseminate the outcomes of FEU projects throughout institutions and provide feedback to FEU. As with the NCRVE, a dissemination strategy is built into the design of each FEV project.

A feature of all the agencies discussed in this paper is the careful documentation of research projects and results. The documentation of NCRVE is indicated above. The English Employment Department produces an annual research report which summarises all research supported during the year and also produces a quarterly digest of research which documents all projects commenced and completed during the quarter. Contact persons within the department are given for each project so that information is readily available for researchers. Projects in both the annual report and quarterly digest are grouped into five broad categories:

1 individuals
2 education
3 small firms and enterprise
4 improving the quality and delivery of training
5 labour market studies and skill issues

Approaches to dissemination are being influenced by interactive concepts of the research-development-dissemination-practice process with the practitioner seen as a more active partner in a dialogue rather than a passive recipient of research findings as in linear models.

Concepts such as the learning community approach to research, development and dissemination which was discussed in the American Research and Education Reform Report require further conceptualisation, development, trialling and evaluation (National Research Council p. 17). However, partnership approaches such as this appear relevant to a period of active reform in VET.

The more coherent approaches to the management of VET R&D that are developing offer prospects of addressing the three key deficiencies identified in the Research and Educational Report in respect of OERI: fragmentation of activities; insufficient collaboration between researchers, teachers and administrators; and lack of integrated assistance for educational reform (Research and Education Reform p. 146).

Funding arrangements

Funding arrangements for VET R&D in the countries reviewed in this paper vary according to the way in which the VET R&D system is organised.

In these countries with a national research centre (Germany, France, United States) a substantial proportion of government funding is channelled through the national centre.

Under the network arrangements adopted by both NCRVE and CEREQ, some of these government funds then flow to other universities which are conducting research within the ambit of the national centre program.

The German Federal Government has a substantial investment in the work of BIBB. BIBB has an annual budget of some DM 42 million. This supports a staff of around 400 including some 150 research staff and enables about 45 projects to be included in the program at any time.

CEREQ has a more restricted mandate than BIBB and does not undertake the range of development and dissemination activities that the German agency does. CEREQ has a staff of 120, including 60 researchers, and had an annual budget of 39 million francs in 1989.

Even where a substantial proportion of government VET R&D funds are channelled through the national research centre, this does not preclude government departments also commissioning mission-oriented research related to the programs of the department.

This approach may be observed in the complex American arrangements which involve:

- the funding of NCRVE by the Office of Vocational and Adult Education of the Department of Education under the terms of the Carl E Perkins Vocational Education Act;

- the funding of the National Centre on the Educational Quality of the Workforce by the Office of Educational Research and Improvement of the Department of Education as one of twenty-five national R&D centres;

- the funding of mission-oriented applied research in such areas as vocational training and employment programs by the Employment and Training Administration of the Department of Labor;

- the funding of the ERIC data system, which includes VET as one of its components, by the Department of Education's OERI.

The funds channelled through the Department of Labor for mission-oriented applied research are considerably greater than the funds that go to NCRVE. Whereas the Employment and Training Administration of the Department of Labor expends around US$40m–$45m each year on research, the federal government grant to NCRVE is currently $5.6m.

NCRVE is, however, able to compete for additional government funding for particular projects and has obtained additional federal funds to conduct summer institutes for teachers in the area of developing innovatory Tech-Prep programs in urban schools and integrating general and vocational education studies. These funds are a share of the federal funds made available under the Perkins Act for pilot projects in these areas.

The US$5.6m federal grant obtained by NCRVE supports the R&D infrastructure and services based at Berkeley and the five sub-contracting institutions (including a share of the salary of the site director in each NCRVE subcontractor) leaving about $3.5m to support research projects.

In the countries without a national VET R&D centre, such as Sweden and England, most VET R&D funding comes through mission-oriented applied research funded by agencies such as the Employment Department in England and the National Agency for Education in Sweden.

In both countries universities are also able to compete for research funds allocated through the research councils but VET proposals tend to do less well than proposals from the other sectors of education.

Substantial R&D funding was provided through the former Manpower Services Commission in England and the Employment Department still has a significant R&D program of around £14m although this is still less than one per cent of program expenditure.

4 R&D agendas and priorities

It is evident from an examination of the research agendas of VET R&D agencies in the countries discussed in this paper that these have broadened in line with the changes in VET in recent years and that there is considerable commonality in the issues that are given the highest priority.

We comment below on six key areas that receive high priority in the R&D programs of most of these agencies.

These key issue areas are:

1 the learning process and learning strategies
2 competencies and skills required in modern, technology-based economies
3 how these skills are acquired
4 VET efficiency
5 VET for special populations
6 integration and re-integration in working life

The learning process and learning strategies

Research issues in the area focus on the learning process, particularly learning by doing and how this could be combined with learning based on cognitive processes. While there is increased interest in adult learning, andragogy as distinct from pedagogy, this still remains substantially a virgin field for exploration.

Increased interest in this area has led to a consequent interest in alternative learning strategies including strategies based on the workplace. BIBB has taken a close interest in the interactions between learning and working and in devising constructive models and strategies for work-based learning. NCRVE has sought to generate new ideas, based on findings from cognitive science, about the process of imparting knowledge, attitudes and skills to young people and adults.

The growing recognition of the need for life-long workplace learning has also prompted an interest in the subject of 'learning to learn', including motivation aspects. Developments in this area are highly significant for training strategies, in particular for adult workers.

Required competencies and skills

All VET R&D agencies have taken a close interest in the changing requirements for competencies and skills of a modern, technology-based economy.

There is wide recognition that skill formation in a modern economy requires combining occupation-specific knowledge and skills with broader, generic skills. While varying terminology has been used

for the latter category of generic or key competencies, the concerns are the same.

Most European training systems have taken a strong interest in 'despecialisation' and it has been argued that the very notion of a 'trade' or 'occupation' is disappearing with the emphasis now on 'horizontal' skills and versatility. There is a consequent interest in the conditions that facilitate the transfer of skills (Jallade 1989).

This interest has been reflected in the current BIBB medium-term program where research on 'interdisciplinary or key skills' is a top priority. This has been directed at the demand for key skills and their practical deployment in the workplace. NCRVE has current work on teaching and learning generic skills in vocational and academic classrooms while this general area is related to the strong NCRVE interest in the integration of general and vocational education. CEREQ has approached this area from the perspective of its strong interest in changing job content and work organisation. This is one of the four main CEREQ research areas. CEREQ has examined the new forms and combinations of skills required under contemporary work conditions including ways of achieving flexibility and 'polyvalence'. The English Employment Department and Swedish agencies have also taken a strong interest in changing skill requirements in consequence of new technologies and work methods.

How these skills are acquired

This research area is reflected in the organisation and content of curricula (including those for specific occupations) and in teaching/learning methods, within both schools and enterprises.

The research interests in the area also cover improving training for teachers and instructors and the use of new learning technologies, modular instruction, co-ordination between general and vocational subjects, new forms of qualifications and corresponding adaptation of accreditation and certification standards and procedures, and overall mechanisms for initiating and overseeing development in these areas.

This area is somewhat less focussed than (1) and (2) and includes a disparate range of development activities. It draws upon research findings from cognitive science on the learning process.

Aspects reflected in current research programs include the priority given by NCRVE to the development of teachers and instructors for vocational education and the work of BIBB on training curricula and new learning technologies such as the *Leittexte* (self-reliant) learning method developed in German industry.

VET efficiency

The increased efficiency and accountability pressures discussed above have led to a strong interest in the efficiency of the VET system. This has prompted an interest in such questions as how

well does VET prepare people for employment and how adequate is the match between the training system and the labour market. The research field includes criteria for judging efficiency, both internal relating to how well the training is adapted to the target group it is intended to serve, and external in terms of access to a job appropriate to the training received, career opportunities, mobility and wages.

This has been a strong area of interest for CEREQ in such aspects as the relationship between training and the changing occupational structure and the role of training in the new economic and technological context including the relationship between skills and economic efficiency at the level of the enterprise.

BIBB has also taken a close interest in the efficiency and effectiveness of vocational training measures and instruments in the light of its role in the development of the German training system. The current BIBB medium-term strategy includes this as a priority and notes that there has been little serious research into the structural interactions in vocational training. BIBB has therefore sought to develop an approach which goes beyond the traditional confines of education economics.

NCRVE interest in this area has included refining the methodologies of evaluation and planning including the use of alternative outcome measures in VET.

VET for special populations

This has been a traditional focus of VET R&D which links with the continuing concern with integration and re-integration of particular groups in working life. NCRVE has given priority to issues relating to vocational education for special populations. In part this reflects the traditional federal role in provision for disadvantaged groups, but also the implications of demographic and social change with the trend to a more diverse workforce in such dimensions as its ethnic composition. NCRVE has therefore taken an interest in how different groups are socialised for work and how they vary in their approaches to learning and schooling.

This has also become an interest of European R&D agencies, in part related to the ramifications of EEC integration so that diversity and mobility in the workforce have been recognised as key issues.

BIBB has had a continuing interest in training for the long-term unemployed.

Integration and re-integration in working

Transition from school to working life was one of the early priorities of European VET R&D agencies during their formative period in the 1970s at a time of high youth unemployment.

While the urgency of youth unemployment has eased with demographic change, this has continued as a strong area of interest

with a broadening of focus to include the re-integration of various populations into working life.

CEREQ has continued to take a close interest in youth entry into the labour market and this is still one of the top priorities of the CEREQ agenda. This relates to the statistical activities of CEREQ which include regular statistical surveys of school and university leavers. CEREQ undertakes studies from such perspectives as unemployment ratios for various groups, job stability, de-skilling and occupational and industry categories. CEREQ follows-up on school leavers who do not proceed to further education or training in association with the Ministry of Education.

BIBB has also given priority to the integration and re-integration into working life of various groups. This has included:

- transition from school to vocational training;
- transition after completion of vocational training;
- return to employment;
- unemployment after several years of employment.

NCRVE has focussed on some of these transitions, in particular the transition from school to post-school vocational education in the context of the current priority given to the Tech-Prep program.

Medium-term programs

It is usual for VET R&D agencies to develop medium-term programs as a means of contributing to coherence in the work of the agency and fostering continuity and accumulation of results. The current medium-term program of BIBB is given in Appendix G. Appendix H gives the medium-term priorities of CEREQ and Appendix C sets out the six issue areas which provide a framework for the annual research program of NCRVE.

In the case of NCRVE, medium-term priorities are influenced by the requirements of the Carl E Perkins Vocational Act.

The 1990 amendments to the Perkins Act require that the applied research and development activities of the national centre shall include the subjects set out in Exhibit C.

These requirements of the Perkins Act do not impose a rigid framework on the work of NCRVE as will be seen by comparing the Exhibit 1 list with the Key Issue Areas of the NCRVE R&D program (Appendix C). Most of the Perkins Act requirements can be related to the six Key Issue Areas of NCRVE and a substantial proportion can be related to the six key issue areas we have identified above.

Nevertheless, the requirements of the Perkins Act have to be taken into account when the NCRVE is developing its annual program so that the American procedures lead to an interplay between the interests of researchers and the requirements of policy-makers and Congress as reflected in the Perkins Act. Congressional

re-authorisation procedures every five years then provide for a review of outcomes of this process.

An evolving agenda

The key issues outlined above involve a mix of the traditional concerns of VET R&D agencies and what may be regarded as the 'new issues' consequent on the current changes in VET. Some traditional issues such as school to work transition are now being examined in different ways in the light of new approaches to linkages between education, training and employment and a greater concern for life-long skill formation in the workforce.

One consequence of the efficiency/accountability pressures discussed in this paper is a growing interest in the accumulation and documentation of research results so that the implications of research findings for policy and practice, and continuing gaps in knowledge, can be more efficiently identified.

The National Research Council Report on Research and Education Reform recommended that OERI should publish a biannual report which would identify research accomplishments and identify unmet needs.

BIBB is currently engaged on a five-year project to document the findings of its research program. When completed this will be a valuable source of information for researchers and policy makers.

Employment agency priorities

While there are common research interests between VET R&D agendas and employment agencies, such as the English Employment Department and American Department of Labour, employment agencies have other priority interests as well in the light of their employment responsibilities.

These may be illustrated by the 1991 search program of the English Employment Department as set out in Appendix 1. This program is based on the medium-term priorities included in the Secretary of State for Employment's Strategic Guidance on Training and Enterprise statement of October 1990 ('1990's: the Skills Decade') and include the following priorities:

1 more effective investment by employers;
2 raising the level of skills and qualifications of young people;
3 encouraging individuals to take more responsibility for their own development;
4 opportunities for unemployed and disadvantaged people;
5 helping education and training provision to become more effective;
6 fostering self-employment and small business growth.

The United States Department of Labour sets its research priorities annually in accordance with the priorities for the department established by the Secretary for Labor. The Assistant Secretary for

Employment and Training then develops R&D priorities for employment and training within this framework. There are currently six major themes which have been broken down into eleven subject area goals.

Exhibit D: ***Requirements of 1990 Amendments to the Carl E Perkins Vocational Educational Act for Research and Development Activities of the National Centre***

A economic changes that affect the skills which employers seek and entrepreneurs need;

B integration of academic and vocational education;

C efficient and effective practices for addressing the needs of special populations;

D efficient and effective methods for delivery of vocational education;

E articulation of school and college instruction with high quality work experience;

F recruitment, education and enhancement of vocational teachers and other professionals in the field;

G accountability processes in vocational education, to include identification and evaluation of the use of appropriate performance standards for student, program and State-level outcomes;

H effective practices that educate students in all aspects of the industry the students are proposing to enter;

I effective methods of identifying and inculcating literacy and other communication skills essential for effective job preparation and job performance;

J identification of strategic, high priority occupational skills and skills formation approaches needed to maintain the competitiveness of the United States workforce, sustain high-wage, high-technology jobs and which address market priorities such as technical jobs needed to protect and restore the environment;

K identification of practices and strategies that address entrepreneurial developments for minority-owned enterprises;

L upon negotiation with the centre, and if funds are provided pursuant to subsection (d), such other topics as the secretary may designate.

There is a similar set of requirements in the 1990 amendments to the Perkins Act in respect of the dissemination of training activities of the national centre. These are set out in Appendix D.

5 General observations and implications

We set out below some general observations on trends and issues in VET R&D arising from the overview of national systems in the five OECD countries considered in this paper.

Role of research and development

There is a growing recognition in a number of OECD countries of the need to redefine the role and relationships of R&D in a period of major educational and training reform. This involves, in part, adjusting traditional approaches to R&D to an emerging broader vision of VET.

This process of adjustment also involves a turning away from the traditional technocratic model of R&D, with its assumptions of a linear process from research to implementation, to more interactive models in which the relationships between research, policy and practice are both more intimate and more complex and uncertain.

The arrangements for VET R&D research in this paper demonstrate a concern to work through a number of the implications of this shift in terms of such aspects as setting research agendas, managing the R&D system and disseminating research findings.

The role of research in the context outlined in this paper depends to a considerable extent on the concept held of educational change and reform. If the view of the United States National Research Council Report is accepted that reform is an organic, developmental process, (National Research Council 1992) then an active R&D program aligned with the reform strategy can play a significant role in VET reform. It is necessary to find ways of linking research and policy integrally, so that through the mirror of the R&D program we gain perspectives on the nature and role of VET 'as it deliberately assesses its own ability to be analytically sceptical and progressively creative about its purposes and outcomes'. The 1969 OECD review of American educational R&D led to the general (but not unanimous) conclusion that R&D goals were 'inherently conterminous' with the goals of the whole educational process. It follows that the process of articulating goals for the R&D system can contribute to establishing goals for VET overall, while the extent to which goals are explicitly formulated for VET will influence the articulation of R&D goals and priorities.

The potential and ramifications of the concept of 'learning communities' of researchers, policy makers, practitioners, employers and unions merits further examination in the context of developing R&D strategies.

Governance

Arrangements for governance of VET R&D vary considerably across the countries examined in accordance with the general approach adopted to the organisation of R&D. In those countries with

government research agencies there is broad representation of the main stakeholders in the arrangements of governance. Both BIBB and CEREQ demonstrate this approach in the composition of their governing policies with employers and union representatives comprising half of the BIBB board. There is value in such an arrangement as a means of linking research to both policy and practice, in providing appropriate channels for dissemination and in strengthening the commitment of the social partners to VET reform objectives.

Organisation of R&D

The three general approaches discussed in this paper illustrate alternative models for the organisation of VET R&D in line with the institutional structures, philosophies and policies of each country (Government Research Agency).

In a period of major economic, social and educational reform there is considerable merit in an intermediary body able to operate between government, the higher education system and education and training practitioners, and which is able to develop strong linkages in each of these directions.

The work of BIBB, CEREQ and NCRVE illustrate alternative approaches to this objective. Both CEREQ and NCRVE operate through networks with links to a number of universities.

This approach has merit in fostering a cost-effective use of resources, in providing a basis for multi-institutional projects, in contributing to awareness in universities of VET research issues and hence generally contributing to enhancing the status of VET.

If a national R&D agency is able to establish such a network across the university system, as well as developing strong linkages with policy and practice, the potential exists for a creative R&D program which is able to draw upon symbiotic relationships between research, policy and practice in contributing to the improvement of VET.

The alternative decentralised, pluralist approach adopted in Sweden and England appears less relevant to the present requirements of the Australian situation.

Current developments and recent experience in these countries point to the need to organise the R&D systems so as to provide for the integration of research, development, dissemination, demonstration and assistance to institutions. Agencies such as NCRVE and BIBB which have broad mandates are better able to contribute to such integration than an agency such as CEREQ with a more narrowly defined mandate. Where a more narrowly defined mandate exists, explicit arrangements are needed to link R&D to institutions and industry training.

The overwhelming concentration of VET R&D on applied research, in consequence of direct government funding, brings a consequent need to find ways to link VET applied R&D and basic research. A number of the main research issues in current VET R&D programs require links to basic research in fields such as cognitive science. The network approach of NCRVE has value in this connection.

Emerging concepts involving partnership arrangements, such as the learning community concept referred to above, pose a challenge to the VET R&D system to develop arrangements that foster close on-going interaction between all players with a stake in the outcomes of VET R&D. Innovatory schemes which create on-going networks, such as the Summer Institutes of NCRVE, illustrate interesting approaches to this challenge.

The 1974 OECD study of educational R&D in member countries distinguished two stages in the development of education R&D (OECD 1974).

(1) traditional academic research
(2) problem or client-oriented applied R&D.

The present scene suggests that a third stage may now be emerging. This may be characterised as an interactive stage in which a central concern is to link problem or client oriented applied R&D with traditional academic research in ways whereby the strengths of each tradition interact with the other for their mutual benefit.

Management of R&D

The strong efficiency, accountability and responsiveness pressures noted in this paper pose a challenge in reconciling these influences with the traditional norms and values of academic R&D so as to achieve an R&D system that is efficient, responsive and accountable, while at the same time open to the requirements of creative, researcher-driven research.

The various balances described in this paper which have been adopted by BIBB and in the overall management of the American R&D system point to ways of reconciling, to the extent feasible, these competing pressures.

These arrangements suggest the need for management plans to have regard to the potential conflict of policy and academic norms and values. This history of the long conflict on the work of the American Office of Educational Research and Improvement, and its predecessor body the National Institute of Education, illustrate the problems in this area.

Setting the R&D agenda

The interactive approaches being generally followed show a careful concern for the process of setting the R&D agenda with extensive consultation and involvement of a range of interested parties. The

method adopted by NCRVE illustrates such a consultative, participative approach. Researcher inputs into the agenda are significant in most systems, although possibly to a lesser extent in systems such as England and Sweden except to the extent that researchers can secure competitive research grants from research councils.

Quality assurance

This is a critical concern in a context where the need exists to establish the status of VET R&D. The careful peer review procedures adopted by agencies such as BIBB, NCRVE and the FEU demonstrate this concern.

However, there is less consistency in ways of promoting the longer-term quality of the VET R&D system in such areas as researcher training. Examples of good practices may be found in policies adopted by such bodies as the England National Council for Vocational Qualifications. The general effect of the American system through the role of NCRVE and its network should be to enhance the quality of VET R&D in the longer term.

Cost-effective use of resources

This has been a growing area of concern in a period of stabilised or declining R&D budgets and with a widening research agenda consequent on the current developments in VET.

Various responses have been discussed in this paper. These include increased use of consortia and network arrangements so as to build on existing resources and areas of expertise and the development of international collaboration, in particular in Europe. The strong interest in accumulating and documenting research results is a further product of this concern.

Linking research, policy and practice

There is a central concern across all systems and new interactive approaches are emerging that link researchers, policy makers and practitioners more closely in the various phases of the research-development-dissemination process.

The arrangements in the United States under the Carl E Perkins Vocational Education Act and the role of NCRVE illustrate one approach in which there are explicit policies to address the required linkages.

More integrated approaches to the dissemination of research findings are being developed with dissemination strategies built into research designs and with on-going arrangements, such as the NCRVE Summer Institute networks. The consequence is that dissemination becomes a process rather than an event with feedback to researchers one of the benefits of the process.

Current approaches to dissemination are generally more strategic in their general orientation and are featured by a wider range of

methods. These include electronic communications networks and specialised databases, as well as more traditional approaches such as the use of newsletters and seminars.

Examination of dissemination strategies in the United States raises the question of the role of mediating institutions, such as American Regional Education Laboratories and the National Diffusion Network, in linking research outcomes to practice. This question has been examined in a recent paper prepared for the OECD Washington International Seminar on educational R&D (Glennan 1992). Mediating institutions are not well developed in the field of education and are even less developed in VET. This is a key question to be considered in developing a national strategy for VET R&D.

A result of the increased interest in linkages between research, policy and practice, has been to up-grade the status of dissemination as a component of R&D activity.

The research agenda

VET R&D agendas have been broadened in recent years in line with current changes in VET. This broadening of the areas of interest poses the danger of dilution of the R&D effort in a context where resources have not been growing in a commensurate way.

Various responses have been noted in this paper including an increase in collaborative work, the growth of research networks, more international co-operation and various efficiency measures within the R&D system.

The broadening of interest in such fields as adult learning, integrating general and vocational education and developing key competencies means that VET R&D is now required to draw upon other sectors of educational and social science research to a greater extent than was the case in the past. Ways of fostering such linkages is a current issue of significance.

There is considerable commonality in the big issues being addressed, although different emphasis may be noted in the European countries discussed in this paper and the United States reflecting particular contextual influences such as the requirements of EEC integration and workforce mobility.

The key issues being addressed in VET research agendas include:

- The learning process including learning by doing and learning strategies in various contexts. Adult learning and approaches to life-long learning
- The competencies and skills required in a modern technology-based economy. Occupational skills and generic competencies. Questions of transferring skills between contexts
- How these skills are acquired through education, training and on-job experience in various contexts. Organisation of the curriculum including the integration of general and vocational

subjects. New forms of qualifications and credentialling arrangements

- VET efficiency: how well does VET prepare people for employment and how adequate is the match between the training system and the labour market in terms of both internal and external criteria
- Provision for disadvantaged groups. This continues to be a central concern of VET R&D linked to issues arising from employment disadvantage and the integration of disadvantaged groups in employment.

All of these issues are relevant to the current reform agenda in Australia.

The increasing internationalisation of educational R&D with increased cross-country collaboration raises issues for Australia in consequence of the geographic isolation of Australia and its exclusion from a number of the forums in which collaboration is being fostered. There is a question as to how Australia can best take account of international R&D results in the key areas relevant to the development of the VET system in Australia.

Towards coherent policies for VET R&D

This overview of current arrangements for VET R&D in five OECD countries points to ways in which most of these countries are working towards more coherent policies for VET R&D in line with current developments in VET. Whether any of these countries can be said to have yet achieved a comprehensive strategy for VET R&D is doubtful although elements of such a strategy exist in each of the countries, in particular in those countries with a national research centre.

There is a critical challenge for the R&D system in adjusting to the major changes which are currently occurring in VET in ways that protect the norms, values and aspirations of research while at the same time contributing to the reform objectives. A number of the interactive approaches discussed in this paper have merit in fostering constructive dialogue and partnership approaches.

There are, in particular, three key issues which need to be addressed in considering how to organise and manage the VET R&D system so as to contribute to both academic and reform objectives.

These are:

1 How best to organise and develop an interactive R&D system so that effective interaction between researchers, policy makers, practitioners, employers and unions is maximised and increased flexibility and responsiveness is built into the system in ways that take account of academic norms and values.
2 How to strengthen linkages between VET R&D and mainstream education and social science research in higher education so

that VET R&D is able to draw upon more extensive research resources including relevant basic research.

3 How overall to manage the VET R&D system so as to achieve an appropriate balance between the competing influences discussed in this paper and so as to contribute to articulating VET goals and outcomes and to up-grading the recognition and status of VET in the community.

In addressing these issues, regard should be had to the concerns that need to be addressed at both a strategic and operational level identified in this paper.

The five systems discussed in this paper illustrate these issues in various ways and offer guidance towards achieving a VET R&D system that is responsive to the challenges confronting VET in a period of fundamental economic and social change.

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Appendix A

Glossary of acronyms

BIBB	Bundesinstitut fur Berufsbildung. The German Federal Institute for Vocational Training, located in Berlin.
CEDEFOP	Centre Européen pour le Dévéloppément de la Formation Professionelle, the European Economic Community European Centre for the Development of Vocational Training, located in Berlin.
CEREQ	Centre d'Études et de Récherchés sur les Qualifications, the French Research Centre for Occupational and Training Analysis, which is at present located in Paris.
CERI	The OECD Centre for Educational Research and Innovation, located in Paris.
ISFOL	Instituto per lo Sviluppo della Formazione Professionale du Lavoratori, the Italian Institute for Occupational and Training Analysis.
NAVE	The United States National Assessment of Vocational Education.
NCRVE	The United States National Center for Research in Vocational Education, located at the University of California, Berkeley.
NCVQ	The English National Council for Vocational Qualifications
OERI	Office of Educational Research and Improvement, United States Department of Education
VET	Vocational education and training. There is no common definition in use across OECD countries and in some European Members of OECD a distinction is made between vocational and technical education so that OECD uses the acronym VOTEC to include both terms.

Appendix B

Mission of the National Center for Research in Vocational Education

The NCRVE has drawn up the Mission Statement which is set out to guide its activities. The centre has been located at the University of California, Berkeley since 1988 and is funded by the United States Department of Education under the terms of the Carl E. Perkins Vocational Education Act. A grant of US $6.0m was provided for the centre in the 1992 financial year.

Under the terms of the Perkins Act the location of the centre is determined on a competitive basis for a period of five years. Prior to its re-location at the University of California, the centre was located at Ohio State University.

The 1990 amendments to the Perkins Act set out a number of objectives for the progress of vocational education in the United States. These include integrating general and vocational education, TECH/PREP and developing performance standards for programs. The National Assessment of Vocational Education Programs required by the Act as part of the next authorisation process (see Appendix F) also sets out a number of objectives that the National Assessment is required to take into account.

While the Mission Statement of NCRVE has regard to these requirements, it also provides a broader statement on key issues needing to be addressed if vocational education is to be increasingly effective in educating for work.

Mission statement

The overall mission of the National Center for Research in Vocational Education (NCRVE) is to engage in research and related activities designed to increase the access of all Americans, regardless of their aptitudes or abilities, to a high quality work life that is not only economically rewarding but also personally fulfilling. Increasing access to satisfy work depends, in part, on better understanding three important questions. First, what knowledge, skills, and attitudes are required to succeed in the workplace of today and tomorrow, and how are these changing? Second, how is this requisite knowledge best learned? Third, how can these abilities be used more productively in the workplace? Consequently, improving employment opportunities for all Americans is at once an interactive inquiry into what students need to know, how best to help them learn it, and how best to use this knowledge in the workplace. this is the inquiry that forms the basis for NCRVE's research and service agendas.

To guide its research, NCRVE relies primarily on pursuing inquiry in a broad range of problem areas and/or disciplines to understand how the work-related knowledge base is changing, how to use this knowledge base more effectively, and how to use education more effectively on the job. Although we are concerned with improving the employment prospects of all students, we are especially concentrating our efforts on lower ability students whom schools have traditionally underserved. Evidence to date suggests that we need to rethink how to structure education along with vocational education, and also to examine the disjunctures between how people work on the job and how they are expected to learn in schools.

Recent research on the changing nature of work, combined with the changing management of workplaces as well as growing evidence from employers shows that, for more and more workers, success depends increasingly on the ability to work in teams, to share information, to pass on skills, and to make connections across tasks and larger occupational domains. These are characteristics of horizontally managed workplaces which have addressed the related problems of

productivity, worker autonomy, and worker morale. These are characteristics which are antithetical to hierarchically organized schools, which stress individual achievement, hoarding of information, teacher-proof curricula, minimum achievement levels, excessive supervision, and the mastery of discrete bodies of knowledge. The result is an inevitable win-lose game, where some students must always be identified as more successful than others. As a consequence, behaviors encouraged in school bear little resemblance to behaviors needed to succeed in work.

Similarly, recent research in cognitive science reinforces long-held precepts that people learn best when abstract principles and concepts are presented in an experience-relevant context, when new learning builds upon prior learning, when students move systematically from the familiar to the unfamiliar, and when there are opportunities to integrate a wide range of knowledge and skills. Unfortunately, many conventional approaches to education ignore these generalizations. Academic education is often delivered in complete isolation from vocational education. Within each of these curricula, there are artificial and arbitrary compartments for organizing the delivery of education into discrete academic enclosures or by narrowly defined occupational identifies. The result is a curriculum so highly fragmented that it can be effectively mastered by only a portion of the most persistent and brightest of students.

What is known about how people learn and about how to effectively organize work requires a critical re-examination of how schooling and work are organized. Traditional paradigms which isolate vocational from academic education are likely to perpetuate a system that makes most knowledge accessible to a very few. Similarly, a failure to scrutinize the ways in which we have traditionally employed skilled labour or compensated for the lack of skills is certain to diminish American productivity and the quality of life available to everyone.

Therefore, the research and service agendas of NCRVE have been organized around the following objectives: (1) better understanding how work is changing and what these changes imply for increasing students' understanding of work opportunities and for improving the relationship between schools and workplaces; (2) identifying better educational strategies for preparing students for work; (3) improving the articulation between secondary and postsecondary and strengthening the capacity of postsecondary vocational education to respond to an increasingly diverse student body; and (4) improving the accountability of secondary and postsecondary education by (a) knowing what to count, (b) enhancing assessment practices,(c) improving methods for monitoring performance, and (d) linking performance to public policy. Each of these will be briefly elaborated upon.

First, we seek to understand how work and its organization is changing and how the nature of different occupations and requirements for success can be better communicated to students of all ages. Additionally, we seek to improve ways to incorporate information about work and work organization into the full range of secondary and postsecondary curricula, including exploring alternatives to traditional approaches to guidance and counseling. Moreover, we believe that there must be better two-way communication between employers and educators. Merely relying on employers to dictate skill needs to educators is not sufficient because opportunities for innovation may be lost. Consequently, NCRVE seeks ways to better use the knowledge of educators to reorganize work and improve the quality of work life.

Second, we are committed to identifying and evaluating new educational designs that are grounded in research and stand the greatest chance of making knowledge and skills more accessible to more students. A promising development, we believe, is the effort to integrate the vocational and academic curricula in secondary and postsecondary education. Integration, however, will require careful implementation and rigorous evaluation. It must include strategies that require change in both the vocational and academic curriculum. Not only should vocational education be infused with much greater academic content, but also the academic curriculum should be altered to take advantage of the benefits of practical applications and learning in a familiar context. To this end, NCRVE is committed to defining alternative models of integration, assessing their effectiveness, and building the capacity of the educational system to operate effective approaches.

Third, NCRVE will devote a substantial portion of its resources to improving articulation between secondary and postsecondary vocational education and to strengthening the capacity of the postsecondary vocational education enterprise. For a growing number of students, vocational education at the secondary level alone is unlikely to constitute sufficient preparation for work. Not only do more and more students not have sufficient time for vocational education in high school, but also more advanced preparation is required in many more fields. To ensure that high school students use their time in vocational education wisely, better articulation with postsecondary vocational education is essential. Additionally, as postsecondary students will continue to become increasingly diverse with respect to age, race, and skills and aptitudes, special attention must be paid to strengthening the capacity of postsecondary vocational education to meet these students' needs and to assure that there is articulation with secondary vocational education.

Fourth and finally, NCRVE is committed to improving public accountability in secondary and postsecondary vocational education. Achieving this aim will depend, in part, on finding better ways to understand what should be counted in order to assess students' progress and their accomplishments in vocational education. It will also depend on designing programmatic and institutional systems of accountability. These systems will need to be sensitive to the dominant structural features of secondary and postsecondary education, while at the same time promising better information on student and institutional outcomes for policymakers and other users of information about vocational education.

Appendix C

Key issue areas of the NCRVE research programs

It is usual for VET R&D agencies to have medium-term programs. In the case of NCRVE, the centre has a list of six key issue areas which supplements the mission statement of the centre. This list is set out over. A detailed annual program is then drawn up for each academic year involving the procedures described in Part 1 of this paper. The 1992 research program of the centre involves 28 projects distributed across each of the six key issue areas. In addition to the research agenda, NCRVE has an active service program which involves most of the sub-contractors in its network.

Research project descriptions

NCRVE's research agenda is divided into six issue areas, each of them consistent with NCRVE's original research agenda. The six issue areas are as follows:

1 Context, goals, planning and evaluation

This issue area examines the changing conditions of employment in order to understand better how the goals of vocational education and the skills taught should be changing. It contributes to refining the methodologies of evaluation and planning, so that information about the effectiveness of programs can be developed and then used to improve existing programs.

2 Curriculum and instructional methods

Once the goals of vocational programs have been established, curriculum and instructional methods must be devised to translate those goals into practice. The research in this area will generate new ideas about the processes of imparting knowledge, attitudes and skills to young people and adults.

3 Vocational education for special populations

Particularly as demographic conditions change, a growing proportion of those needing occupational preparation will require special assistance in order to benefit fully from vocational programs. The analyses will focus not only on how existing programs for special populations can be improved, but also on more fundamental issues of how different groups are socialized for work and how they vary in their approaches to learning and schooling.

4 The development of personnel in vocational education

In the recent 'second wave' of educational reform, it has become clear that responsiveness to changing conditions is impossible without reforming the preparation of education professionals. This issue is especially important in vocational education, since the preparation of vocational teachers and administrators is so varied and policies have been so inconsistent. Research in this issue will examine the current status of vocational teacher preparation, the nature of leadership in administration, and ways to prepare effective vocational leaders.

5 The delivery system of vocational education and training

Over the past three decades, vocational education and training have expanded in many institutions other than the high schools in which vocational education originated. The projects in this issue area will examine a wide variety of occupational preparation methods, concentrating especially on their relationships with high schools and community colleges and on the relative effectiveness of vocational preparation in different institutions.

6 Governance and policy

This issue area examines the status and the effectiveness of the current system of Federal, State and local policymaking in secondary and postsecondary vocational education.

Appendix D

Requirements of the Carl E Perkins Vocational Education Act for dissemination of training activities of the national centre.

The Carl E Perkins Act authorises the funding of one or two national centres in the areas of:

A applied research and development

B dissemination and training

These functions may be combined in a single national centre and this is the present situation where the national centre located at the University of California, Berkeley combines applied research, development, dissemination and training functions.

The Perkins Act specifies functions to be undertaken by the national centre in both the applied research/development and dissemination/training areas. The requirements of the Act for research and development are presented earlier in this paper. The requirements of the Act in the case of dissemination and training are listed on the following page. NCRVE and its sub-contractors has developed a comprehensive program in these seven areas in response to these requirements.

In addition to these requirements the Perkins Act also requires that the Secretary for Education establish a system for disseminating information resulting from R&D activities supported under the Act. In doing this the secretary is required by the Act to use existing dissemination systems including:

- the National Diffusion Network
- the National Center for Research in Vocational Education
- the National Network for Curriculum Co-ordination in Vocational and Technical Education

The National Diffusion Network (NDN) was established in the early 1970s along with the Joint Dissemination Review Panel (JDRP) to provide a mechanism to judge the effectiveness of innovatory programs and to help disseminate those that are found effective.

In 1987 JDRP was restructured and renamed the Program Effectiveness Panel (PEP). PEP functions to validate effective innovating programs which are then disseminated through the National Diffusion Network.

PEP comprises a system of about 60 members who review evaluation data on innovatory programs and who decide whether to certify a program as effective in terms of its stated objectives.

If a program is certified by PEP it becomes part of the NDN dissemination network. This involves dissemination in three ways:

(i) a brief description of the program and content information is printed in a comprehensive guide to NDN programs;

(ii) NDN funds facilitators in every state to assist schools to identify needs, consider the relevance of NDN programs and adapt suitable programs;

(iii) the developers of approved programs are eligible to compete for NDN funds for 'developer demonstration' or 'dissemination process' projects.

Some states supplement NDN funds to enable facilitators to conduct awareness conferences and provide technical assistance to local school districts.

'(c) DISSEMINATION AND TRAINING - (1) The dissemination and training activities shall include –

'(A) teacher and administrator training and leadership development;

'(B) technical assistance to assure that programs serving special populations are effective in delivering well-integrated and appropriately articulated vocational and academic offerings for secondary, postsecondary, and adult studies;

'(C) needs assessment, design, and implementation of new and revised programs with related curriculum materials to facilitate vocational-academic integration;

'(D) evaluation and follow-through to maintain and extend quality programs;

'(E) assistance in technology transfer and articulation of program offerings from advanced technology centres to minority enterprises;

'(F) assistance to programs and States on the use of accountability indicators, including appropriate and innovative performance standards;

'(G) delivery of information and services using advanced technology, where appropriate, to increase the effectiveness and efficiency of knowledge transfer;

'(H) development of processes for synthesis of research, in co-operation with a broad array of users, including vocational and non-vocational educators, employers and labor organisations;

'(I) dissemination of exemplary curriculum and instructional materials, and development and publication of curriculum materials (in conjunction with vocational and non-vocational constituency groups, where appropriate);

'(J) technical assistance in recruiting, hiring, and advancing minorities in vocational education; and . . .

(extract from Carl E Perkins Act)

Appendix E

Work of the National Center on the Educational Quality of the Workforce, University of Pennsylvania

In addition to funding NCRVE, the United States Government funds a network of 25 national research and development centres through the Office of Educational Research and Improvement (OERI) of the Department of Education. This network of national research and development centres grew up during the nineteen sixties during a period of significant expansion of federal education R&D funding associated with Great Society programs.

The national network of R&D centres is supplemented by a similar network of regional education laboratories, also funded through OERI, whose role relates to development, demonstrations, dissemination and technical assistance. While this division of labour is not mandated by law, it has prevailed, with some variations, since the nineteen sixties. In this respect the national R&D centres differ to NCRVE which has a broader mandate combining research, development, dissemination and training.

One of the network of national R&D centres functions in the general area of vocational education and training. This is the National Center on the Educational Quality of the Workforce, University of Pennsylvania. The abstract which appears on the following pages summarises the work of this national centre.

It will be seen that this national centre, like NCRVE, operates on a consortium basis with links to the Wharton Business School, University of Pennsylvania, the New York State School of Industrial and Labour Relations, Cornell University and the Institute for Research and Higher Education, University of Pennsylvania.

Such a consortium approach has been promoted by OERI and is a common feature of the 25 national R&D centres.

National Center on the Educational Quality of the Workforce

Grantee: The University of Pennsylvania
4200 Pine Street
Philadelphia, Pennsylvania 19104-4090

Co-directors: Dr Robert M Zemsky
Dr Peter Cappelli

Affiliated organisations

Consortium members

The Wharton School, University of Pennsylvania
The Institute for Research on Higher Education, University of Pennsylvania
The New York State School of Industrial and Labor Relations, Cornell University.

Abstract

The mission of the Center on the Educational Quality of the Workforce is to engage leading researchers, practitioners, and policy makers in a sustained dialogue that will make American firms

more adaptive and competitive, make American workers more aware of the skills needed and the opportunities for acquiring them, and make American schools at every level more successful in meeting the learning needs of both employers and individual members of the workforce. Renewing American competitiveness requires a revitalized education and training market in which businesses and employees see themselves as joint beneficiaries in the educational suppliers to produce the instruction services and materials that meet their needs. In order to facilitate the formation of the necessary linkages among businesses, workers,and educational suppliers, the centre is directing its energies towards three major efforts—research, dissemination and sustained dialogue.

The centre's research efforts are organized according to several major themes: providing a calculus for estimating the scale and effectiveness of work-related training and education ; understanding firm behaviour with respect to training investments and employment practices; exploring options and opportunities open to states to enhance the productivity of their workforces; preparing American students to make the school-to-work transition; and conducting comparative international studies on the education and training practices. Pilot projects are incorporated into the research agenda in order to translate the centre's research findings into actual practice. Centre projects include:

1 Basic enumerations and data collection

The objectives of this project are to develop, design, test, and make available to the research and practitioner communities integrated data sets for benchmarketing the scale, scope, and content of the work-related education and training of adult learners.

2 Changes in firm behavior

This project addresses the question of why some firms choose to invest in education and training, and others do not. The investigations within this effort are designed to quantify the experiences and behavior of firms with respect to employment practices and investments in education and training. It will involve a large number of case studies.

3 State options and opportunities

This project translates the centre's research and policy analyses into a series of state-wide policies and state options for investing in a skilled labor force. The first event in this project is a roundtable discussion centring on the popular state policies of investing in the 'human capital' of its workforce and how these policy statements can be implemented effectively.

4 School-to-work-transition

The goal of this project is to improve understanding of the components that are necessary to create a productivity link between education suppliers, workers, and employers. It includes a field investigation of the hiring and promotion decisions of both small and large firms, focussing on how educational requirements become identifiable facts in the process.

5 Occupations and earnings of former vocational education

This project investigates the occupations and earnings of former vocational education students. The goal is to develop useful definitions of educational outcomes; a methodology for assessing the effectiveness of vocational education; and a report, based principally on data drawn from the State of Florida.

Because of the inadequacy of previous efforts to make research accessible to other researchers and to the practitioner community, dissemination and discussion have equal standings with the centre's fundamental inquiry activities. Among the centre's dissemination efforts are: a seminar series geared toward policymakers, and their staffs, publication in newspapers, the popular press, and trade magazines of articles and columns based on the centre's work; the formation of working roundtables of CEOs; and the centre's own flexible, targeted publications program. These separate dissemination efforts are all linked by a strong set of visual materials to ensure quick recognition of the centre among its constituencies.

Appendix F

National Assessment of Vocational Education

The Carl E Perkins Vocational Education Act mandates that a National Assessment of Vocational Education (NAVE) shall be prepared by the Office of Educational Research and Improvement (OERI) of the Department of Education and submitted to Congress by specified dates to provide an independent evaluation for Congress of the outcomes of funding provided under the Perkins Act.

The national assessment is undertaken every 5 years to a timetable aligned with the re-authorisation by Congress of the Perkins Act each 5 years. The last national assessment was submitted to Congress in 1989 for the 1990 re-authorisation of the Perkins Act. The 1990 amendments to the Perkins Act require that an interim report shall be submitted to Congress by January 1994 and a final report by July 1994. The following pages set out the requirements of the Perkins Act, as amended in 1990, for the national assessment.

NAVE provides valuable feedback to Congress on the outcomes of federal funding of vocational education under the Perkins Act and also serves to provide a useful overview of the state of vocational education across America. The preparation of NAVE requires the conduct of considerable research on the issues to be reported to Congress.

With the 1989 NAVE report, five broad research areas were investigated. These were:

1 implementation of the Perkins Act
2 access of special populations to vocational education
3 status of vocational education in secondary schools
4 status of post-secondary vocational education
5 skill training and the economy

Planning for the 1994 NAVE report is underway and is being co-ordinated by a project team in OERI. Surveys and case studies will be used in preparing the next NAVE report which is expected to focus on four research areas:

1 implementation of the Perkins Act
2 access of special populations to vocational education
3 quality of vocational education
4 vocational education and the economy

The national assessment serves as a focus for debate on the condition of vocational education. Interested organisations contribute to this process through meetings organised in support of this review process.

For example the NCRVE reported on a symposium held in 1988 sponsored jointly by the NCRVE, the American Vocational Education Research Association and the University Council for Vocational Education: NCRVE, The National Assessment of Vocational Education 'What It Says and What It Should Say'.

Appendix G

Medium Term Priorities of the German Federal Institute for Vocational Training (BIBB)

The German Federal Institute for Vocational Training (BIBB) was established in Berlin in 1970 under the terms of the Vocational Training Act of 1969.

It was subsequently re-structured in 1976 under the Employment Assistance Act of that year with a broader mandate directed at countering youth unemployment.

The main tasks of BIBB are to assist in the preparation of training regulations, support the establishment and development of regional training centres, compile and publish annually the register of recognised training courses, evaluate vocational correspondence courses and generally to act as an adviser to the Federal Government of vocational education and training.

BIBB operates under a governing board with equal federal, state, employer and union representation. This means that BIBB is required to be responsive to the interests of each of these policies.

BIBB has a five-year medium-term program which provides a framework for its annual program activities. The medium-term program shown on the following pages indicates the six priority areas of the current BIBB research agenda.

Priority 1: Interactions between information and communication technologies, work organization and training

With their wide range of applications, information and communication technologies will in many ways make decisive changes to most workplaces in the 1990s and also lead to further rationalization operations and a shift in employment potentials. Technology, work organization and training interact in a very complex manner. Gaining an understanding of these interactions is a major challenge to vocational training research.

Priority 2: Interdisciplinary (key) skills within the context of work and personality

There is general agreement that developing the expertise required for the future will depend on combining occupation-specific knowledge and skills with interdisciplinary (key) skills. However, there is still no differentiated and practical understanding of actual demand for these interdisciplinary skills and their practical deployment; there is also a lack of information and practicable concepts for developing such skills.

Priority 3: Skill requirements and training in environmental protection

Vocational training research must intensify its work to identify the future demand for knowledge and skills in environmental protection and improve the training provision in this field. Environmental education must also play a role in vocational training as a whole. The main areas of research are to be to develop additional material for in-company initial vocational training in occupation-related environmental protection, to devise concepts and measures to give this issue a stronger profile in continuing training measures, and to explore new occupational fields which are of particular relevance to environmental protection.

Priority 4: Changing learning conditions within the work process

Vocational training takes place as an interaction process involving learning and working, with the respective weight of these components and their quality differing markedly depending on the occupational field, individual learning phase, corporate conditions and education and training goals concerned. the boundaries between work and learning are blurred, and sometimes it is impossible to demarcate the two individual fields: learning takes place during work, at the workplace, as solutions are found to cope with work assignments.

For many years the tendency has been to remove intentional teaching/learning processes from the real-life work environment; systematized learning became increasingly important, even within a company-training context. Recently, however, there has been increasing evidence of a variety of efforts to bring the real-life work context back into the training environment. This opens up an important field for research: that of developing forward-looking and differentiated concepts on the value of work-based learning and also devising constructive and practicable models for this form of vocational training.

Priority 5: Integration and reintegration into working life

In addition to exploring the transition from school to vocational training (the first threshold), the Institute will be paying increasing attention in the coming years to the following transition phases:

- transition after completion of vocational training (second threshold)
- unemployment after several years of employment
- return to employment

Particularly stringent demands will be placed on continuing training in solving the problems attendant on these transition phases, in particular that of reintegration into working life. More intensive research is required on the following issues in order to improve training quality standards:

- changing participation structures
- changing quality requirements for continuing training
- improving pedagogic skills among continuing training personnel

Priority 6: Effectiveness of vocational training measures and instruments (education and training policy)

Information on the effectiveness of restructuring operations and large-scale programes and packages introduced for the vocational training field is of considerable importance to designing the vocational training policy of the future. Without detailed information on the impact of decisions taken and schemes introduced it would be extremely difficult to find a sound basis for improving the existing design instrumentarium for vocational training or recognize political action alternatives and adopt an innovative approach.

However, there has traditionally been very little serious research into the structural interactions in vocational training. It is therefore necessary to develop an impact research concept which systematically explores the effects of large-scale and far-reaching interventions in the vocational training system and which extends in approach beyond the traditional confines of education economics.

Appendix H

The work of CEREQ

The French Centre d'Études et de Récherchés sur les Qualifications (CEREQ) was established in 1976 as a national research centre concerned with the issues relating to job analysis, occupations, skills and youth employment.

CEREQ produces statistical information in these areas and also acts as an expert adviser to government agencies in the fields covered by its mandate.

CEREQ was established at a time of skill shortages in a number of important areas relevant to French economic development. Its role was directed at producing a better relation between the education and training system so as to reduce skill shortages and meet the requirements of the economy. Later in the 1970s, unemployment became a more significant problem in France and the work of CEREQ was developed so as to address employment issues.

In this context the objectives of CEREQ were defined as:

- to undertake studies and surveys on the relationship between education, training, work and employment and to formulate proposals on their implications for education and training policies.

This focus on analytical studies means that CEREQ has a more restricted mandate that BIBB and NCRVE both of whose mandates include training and dissemination functions.

In 1985 CEREQ became an autonomous agency with relationships to the Ministries of both Education and Social Affairs.

This dual allegiance reflects the respective responsibilities of these departments in the areas of education and training.

CEREQ operates with a network of 15 associated centres in the French university system. France has a centralised education system with separate vocational streams at both the secondary education and higher education levels. The centralised nature of the French system means that the results of CEREQ research is able to influence policy towards schooling and post-secondary education and training.

The CEREQ program has been largely organised around four main research areas:

1 **Youth entry into the labour market**

CEREQ is the main provider of data on access to employment by school and university leavers from each educational level. Data are analysed from the point of view of unemployment ratios, job stability, de-skilling, occupations and industry.

In CEREQ's decentralised survey, questionnaires are forwarded to all pupils who left school during or at the end of the previous school year. Initial data compilation gives simple indications of former students' status for the schools. Regional statistical units sum these results for a later detailed analysis at national level by the Ministry of Education. CEREQ analyses a representative sample of the questionnaires.

2 Training as an adjustment tool for firm's strategies

At the request of the Ministry concerned with training and with its financial support, CEREQ is responsible for the processing of the statements by enterprises regarding their expenditure on workers' training. Resulting statistics are published every year. They allow for an evaluation of how the training effort evolves and of how it is distributed between sectors, large and small firms, workers' occupations and regions.

3 The changing occupational structure

CEREQ's occupational analysis includes individual characteristics such as age sex, training and work experience. It also takes into account the conditions under which people take and leave an occupation and legal regulations whenever they are required. It also involves a description of employment conditions, sectors of activity and size of firms.

These converging approaches are aimed to help formulation of employment or training policies which aim to anticipate, correct or follow the identified evolutions in occupational structure.

4 Changing jobs contents and work organisation

Analysis of jobs and organisations cannot be restricted to the study of implications of technological change and corresponding skill requirements. Production modifications, new economic constraints, incidence of management methods, quality as a priority and searching for flexibility through polyvalence are also decisive elements. Work analysis should be based on field surveys within firms among personnel managers, professionals and as far as possible among workers themselves.

Appendix I

Medium-term priorities and 1992 Research Program of the English Employment Department

The English Employment Department's training research program is structured around six medium-term priorities for training and enterprise development, identified by the Secretary of State for Employment in his October 1990 statement '1990's: The Skills Decade'.

Priority 1 More effective investment by employers

Employers in the years ahead must assess their skill needs more effectively and plan to meet them through:

- a public commitment at company director level to develop all employees to achieve their business goals;
- regular reviews of the training and development needs of all their employees;
- taking action to train and develop their employees on recruitment and throughout their employment;
- evaluating the investment in training and development to assess achievement and improve future effectiveness.

The department's program of research includes a major study on all aspects of employers' labour practices, the *Employers' manpower and skills practices survey*, also a complementary study of a national representative sample of about 4250 establishments, the *Skills monitoring survey*.

Priority 2 Raising the level of skills and qualifications of young people

Three key issues in motivating young people to achieve their full potential and develop the skills the economy needs are seen by government as:

- the need to provide more opportunity for young people leaving school at 16 to enter fulltime education at a later stage;
- the need to improve standards of training for young people entering the workplace;
- the need for young people to have a greater say in the type of training they undertake.

All young people who choose to leave fulltime education and who cannot find a job are guaranteed a place on *Youth Training*, a scheme now delivered by TECs. Training Credits pilots have been introduced to give young people a wider choice of training routes and opportunities.

Priority 3 Encouraging individuals to take more responsibility for their own development

Key initiatives relate to this priority:

- training credits pilots
- management charter initiative
- career development loans

Priority 4 Opportunities for unemployed and disadvantaged people

Employment Training is the department's major program for training unemployed adults. It normally provides up to twelve months' training for those taking part.

Other programs include High Technology National Training, offering retraining in professional level skills. Research and study is carried out into off-the-job training and those with special needs, such as the *English for Speakers of Other Languages*.

Priority 5 Helping education and training to become more effective

The *Technical and Vocational Education Initiative* has been running since 1983, for 14–18 year-olds throughout the country by trying to make what young people learn at school more relevant to the world of work.

Evaluation of TVEI and forward development programs for further education are in progress by local education authorities. *Compacts* is a program involving over 5000 employers and training providers and 300 schools and in which so far 50 000 young people have been offered a job with training in return for the achievement of agreed personal objectives.

Higher education initiatives include research and case studies on graduate effectiveness, enterprise and understanding of work needs and assessing the effectiveness of the Technician Engineering Scholarship Scheme in attracting women into engineering and the implications of computer interaction in the workplace.

Priority 6 Fostering self-employment and small business growth

Two major schemes are the *Business Growth Training* and the *Enterprise Allowance Scheme*, providing support for small businesses and those unemployed who wish to set up their own business with an allowance during their first year of operation.

The Training Enterprise and Education Directorate (TEED) of the Employment Department is the successor body to the former Manpower Services Commission and Training Agency. Both these agencies had active research programs in the area of VET and TEED has continued this tradition.

In addition to its annual training research report, TEED produces a quarterly digest of research which summarises current and completed research projects.

[Other details may be found in the English Employment Department's 1991 Annual Report on Training Research, pp. 66–73.]